

## ABSTRACT - MECHANICAL AND ELECTRICAL SCIENCE

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### **FOCUS POSITION INFLUENCE ON THE MOLTEN ZONE FOR LASER BEAM IRRADIATION OF STEEL PIECES**

**Abstract:** For laser welding focal plane position relative to the workpiece surface generate special effects on the material melted zone. Focus effects were analyzed in relation to the power and welding speed. Characterization of fusion lines obtained with laser beam on the thick steel plates was performed for sizes measured for cross section through the piece and piece surface. It has been shown that the defocus produce significant variations in relation to the welding speed and to low level of power

**Key-words:** laser welding, steel, response surface, laser beam defocusing, melting

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### **INFLUENCE OF FRICTION IN THE DRAWING A CYLINDRICAL PART BRASS**

**Abstract:** In this paper are analyzed the variation of deformation, the stresses of flow, the wall thickness in case of drawing process simulation conducted under two conditions: without the use of a lubricant used in liquid form. The analysis aims to establish the influence of friction on the quality of the piece drawing brass.

**Key-words:** punch, die, brass

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### **INDUCTION GENERATOR WITH CAPACITIVE EXCITED USED AS A SOURCE OF ELECTRICITY GENERATION IN WIND INSTALLATIONS**

**Abstract:** Asynchronous generators are the most robust types of generators. They are used in the vast majority in suprasincron regime, coupled power network. They cover power range between tens of kW and 2-3 MW. Since the network has constant frequency, resulting asynchronous generators operate with constant speeds. Asynchronous generators that operate at constant speeds is a disadvantage because they will not be able to extract the full power available aerodynamically, which would require the increasing speed. Another disadvantage is that their starting made as engine for to bring the aerodynamic rotor at the operation speed. That advantage can mention is stable operation over the network. Conversion efficiency of asynchronous generators are generally than lower synchronous generators.

**Key-words:** wind energy, asynchronous generator, excitation frequency.

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### **ASSESSMENT, BASED ON THE SCAN, THE APPEARANCE OF FINISHED SURFACES BY FINPLAST METHOD**

**Abstract:** This paper presents the possibility of using scanning method to analyze the mechanical processed surfaces. For example the author presents the effect on antifriction alloy surfaces finished by FINPLAST process.

**Keywords:** sliding bearings, FINPLAST, scanner

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### **BLACK SEA METEOROLOGICAL FACTORS ANALYSIS FOR IMPLEMENTING RENEWABLE ENERGY SOURCES INTO NAVAL POWER SYSTEMS**

**Abstract:** The issue paper is to present renewable energy sources, insisting mainly on wind energy. This source is analyzed in the context of Romania in particular and the EU in general. A turbine with horizontal axis is usually coupled with vessel power systems. Wind energy knows an increased growth rate. At the end of the paper are presented possible structure of coupled a wind to power systems.

**Key-words:** renewable energy, wind energy, wind turbine, vessel energy system.

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### **OPERATION ALGORITHM OF AN ELECTRONIC SYSTEM FOR CONTROL OF THE LOADING - UNLOADING DURATION IN A FOOD STORAGE REFRIGERATED CHAMBER**

**Abstract:** The specifics of existing electronic systems for control of a food storage refrigerated chambers have been analyzed. The results show that during prolonged loading and unloading procedures the technological requirements for storing the production are violated. The necessity for automated control of the duration of loading and unloading with a model has been substantiated. The criteria for control and the basic tasks, required to perform the technological requirements, have been formulated. An algorithm and a structure of an electronic control system have been presented. The algorithm is based on a model, describing the heat exchange in a food storage refrigerated chamber.

**Key-words:** food storage refrigerated chambers, model, and electronic control system.

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### **THE FEATURES OF MARINE HEAVY LIQUID FUEL BURNING**

**Abstract:** The marine engines use a very efficient fuel, but they have a relatively high output of NO<sub>x</sub> emissions. The slow speed diesels tend to produce higher NO<sub>x</sub> emissions than medium speed diesels. NO<sub>x</sub> emissions participate to the formation of photochemical smog and acid rain. NO<sub>x</sub> formation depends on the temperature of the burnt gas, the residence time of the burnt gas at high temperature and the existing amount of oxygen. This work presents the main theoretical characteristics of the ignition and combustion of the marine heavy fuel oil.

**Key-words:** ignition, combustion, emission, low NO<sub>x</sub>.

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**SUSTAINABILITY OF THE PRODUCTION OF COMPOSITE BOAT BY LIFE CYCLE MANAGEMENT APPROACH**

**Abstract:** This study is designed on the basis of Life Cycle Assessment (LCA) to conclude quantitatively the “sustainability” of GRP (glass reinforced plastic) boat building process from purchasing raw materials to recycling. With LCA, carbon emissions amount, energy consumption, total weight difference between the first usage and recycling and potential contribution to global warming for whole supply chain can be considered for the products’ cradle to grave life, even by including the recycling processes cradle to cradle life. In this study, the above mentioned parameters will be presented by making a comparison for two different GRP building methods namely hand-laying up and vacuum assisted. The results have been obtained from “Umberto” carbon footprint software which is specially developed and designed for all of the material life cycle processes (production, use, waste management) with enhanced material flow. These results have been presented for the benefit of the related industry’s stakeholders such as manufacturers, designers, suppliers and recyclers.

**FLORIN POPESCU, FLORIN ENACHE (pg.136-141)**

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**TRAINING OF RBF NEURAL NETWORKS: A COMPARATIVE OVERVIEW**

**Abstract:** According to literature, it is well-known that the training algorithm of RBF neural networks depends a lot by the specific way to obtain the positioning of RBF centers over the input data space, and to fit the neural weights to the output layer, respectively. Having as starting point a real pattern recognition task belonging to video imagery to solve, this paper presents a comparative analysis of some standard and advanced approaches used to assure a high-quality training process of RBF neural networks.

**Key-words:** connexionist models, RBF neural network, pattern recognition

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**COMPLETELY STABILIZED OPERATING MODES OF THE CAR PROPULSION SYSTEMS**

**Abstract:** By customizing a mathematical model, previously developed by the authors, has done a simulation to define a completely stabilized operating modes of propulsion systems and their dynamic, economic and pollution parameters. This provides, even the design phase, definition of additional constructive and functional criteria against the current, to ensure stable and economic operation, in an area as extensive.

**Key words:** automotive power train, stable and economic operation.

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**ANALYSIS OF HUMAN BODY HIPER-EXPOSURE TO ELECTROMAGNETIC FIELDS ON SEAGOING VESSELS**

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**STUDIES AND EXPERIMENTAL RESEARCHES ON PHYSICAL AND MECHANICAL PROPERTIES OF ALUMINIUM ALLOYS**

**Abstract:** In the aerospace technique, the weight of the aircraft affects flight performance, so using the light and superlight alloys is extremely widespread. Improving the properties of these alloys is an extremely current requirement, which is justifying the researches

**Key words:** aluminum, heat treatment, hardness, microscopic analysis.

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**MECHANICAL STRENGTH AND HARDNESS FOR ALUMINIUM ALLOYS USED FOR HEAT ENGINE PISTONS**

**Abstract:** Aluminum alloys are used for building heat engine pistons. Were developed and studied four types of alloy from Al-Si and Al-Cu systems. To determine the influence of temperature on the properties and states in alloys studied □ (continuous heating to 300°C) and keeping time at higher temperatures to reproduce as accurate possible the real operating cycles for pistons engine have been □ determinations of mechanical strength  $R_m$  [daN/mm<sup>2</sup>] and hardness HB [daN/mm<sup>2</sup>]. Was varied maintaining times a certain temperature in the heat treatments to achieve stabilization of the mechanical characteristics. Heat treatment applied consisted in a hardening and a return at hot. Discuss the usefulness of heat treatment relative to the piston engine operating temperature.

**Key-words:** aluminium alloys, engine pistons, heat treatment, hardness HB, stabilization time

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**A RENEWABLE ENERGY SYSTEM FOR THE UTILIZATION OF SEA AND RIVER CURRENTS**

**Abstract:** Utilization of sea and river currents, where high flow rates are present despite the lower speeds has been attractive area for renewable energy engineers. In oceanside countries with coastlines where the tidal currents are high, several projects have been realized. However, countries in inner seas, for example, Mediterranean and Black Sea coast countries, the currents are driven by salinity gradients and are often restricted to a limited surface layer. Therefore, large diameter water turbines or tidal dams are not viable methods for energy conversion. Instead, devices with drag-driven elements are deemed more appropriate to exploit the energy in such currents. The concept proposed in this paper is based on a number of tandem “drogues located on a closed chain loop. The paper includes a hydrodynamic analysis, based on a recent experimental research on tandem drogues. Conditions for an optimum efficiency and power output analysis shall be included. A configuration shall also be proposed, involving anchored or bottom-fixed platforms. The system is deemed to be appropriate both for sea and for riverine applications.

**Key-words:** Drogues, sea currents, renewable energy, hydrodynamic drag, tandem object drag